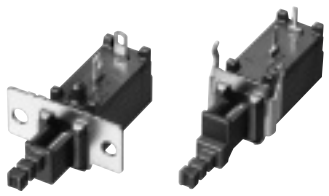
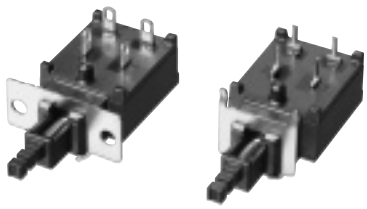
■ Quick Selection Guide

	Type	Operation	Travel	Circuit Diagram					Acquired Standard							Page
				SPST	SPDT	DPST	DPDT	Others	*	UL	CSA	SEMKO	VDE	BEAB	Others	
Series R	ESB92S 	Push	1.5 mm 2.5 mm	○					*	○	○	○	○	○	○	13
	ESB92D 	Push	1.5 mm 2.5 mm			○			*	○	○	○	○	○	○	16

* Power switches described here are not under jurisdiction of the Electrical Appliance and Material Safety Law, but comply with its technical requirements.

■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9
E	S							

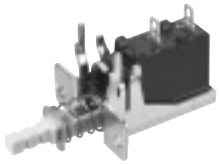
Product Code — Design No.

3th	4th,5th,6th	Type
B	92S	Compact Push Type (SPST)
	92D	Compact Push Type (DPST)

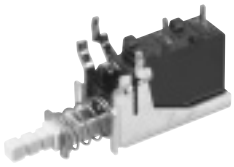
■ Product Consolidation

● **Type ESB82**

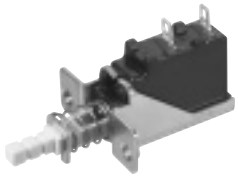
PWB Mount Type 1



PWB Mount Type 2

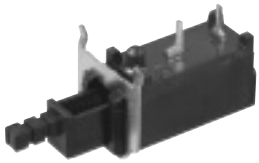


Solder lug Type

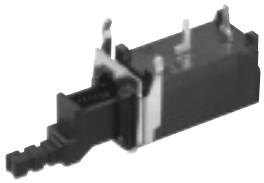


● **Type ESB92S** (Rating TV-5, 5 A 250 V ac / 4 A/128 A 250 V ac)

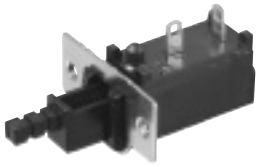
PWB Mount Type 1



PWB Mount Type 2



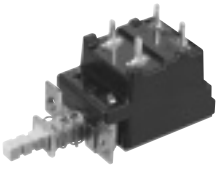
Solder lug Type

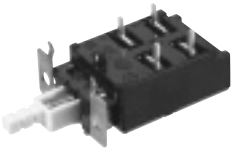


● **Type ESB99** ● **Type ESB91**

PWB Mount Type

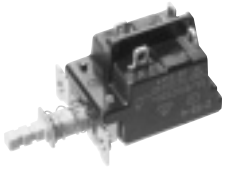
Type ESB99 Type ESB91

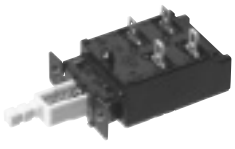




Solder lug Type

Type ESB99 Type ESB91

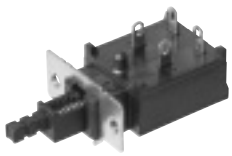




● **Type ESB92D** (Rating TV-5, 5 A 250 V ac / 4 A/128 A 250 V ac)

PWB Mount Type

Solder lug Type



■ Checklist Before Inquiry

When specifying Power Switches, please take advantage of our standard products for better price and delivery. Please inquire about the following items before ordering.

Item				Information (Requirements)
Common	C-1	Inquiry purpose		New use, Modification, Others ( )
	C-2	Modification	Previous supplier	
			Conventional part No.	
			Purpose	
	C-3	Application	Equipment	
			Environment	Indoor/Outdoor use, Stationary/Portable set, High humidity, SO_2, NaCl
			Temperature	(°C) to (°C)
Regulations	S-1	Safety Standards* (Ratings)	UL CSA	TV-5
			SEMKO DEMKO VDE NEMKO BEAB FIMKO SEV (SETI)	4 A/128 A 250 Vac (Based on IEC standards)
			Others	
Shapes/Dimensions	M-1	Operation	Operation type	Push type, Others ( )
			Operating force	When specially requested (N)
	M-2	Circuit Diagrams		SPST, DPST
	M-3	Lever length (Push type)		18.0 mm
		Travel (Push type)		1.5 mm, 2.5 mm
	M-4	Mounting	Mounting holes	2-M3×0.5 Tap, 2-ϕ3.2 hole W/O Mounting Plate, Others ( )
			Supporting legs	Necessary (PWB mount type, Solder lug type), Unnecessary
			Mounting height	PWB to center of rod
	M-5	Terminals	Shape	PWB, Solder lug, Others ( )
			Connection	Manual soldering, Wave soldering
	M-6	Lever top dimensions		Width (mm) × Height (mm) × Length (mm)
Others	L-1	Special requirements for endurance		
	L-2	Special requirements for safety		
	L-3	Other questionnaires		

* Power switches described here are not under jurisdiction of the Electrical Appliance and Material Safety Law (Japan), but comply with its technical requirements.

Notes:
1. When you specify custom types (custom-made), new tooling and jigs, and/or equipment may be required. It will be necessary to confirm your estimates of quantity and development schedule as accurately as possible.
2. Please inform us if you designate your own part number.

■ ⚠ Application Notes

When using our Power Switches, please observe the following items (“prohibited items”) and be cautious of the following in order to prevent dangerous accidents and deterioration of performance.

1. Prohibited items and notes on mounting

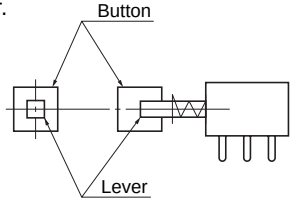
1. Operation position for soldering (including preheating)
   Push type switches: Do not solder in the locked condition.
   Slide type switches: Be sure to switch the lever securely when soldering.
2. When soldering using a soldering iron, soldering conditions vary with the tip shape of the soldering iron, wattage, and PWB thickness. Thoroughly check the conditions in advance, including the heat resistance rating of the solder.
3. Do not apply a load to terminals when soldering. Care should be taken in this regard because a load may deteriorate electric and mechanical characteristics.
4. Since the power switches are not sealed, do not wash them.
5. When mounting a power switch to a through-hole type PWB, the influence of thermal stress on the switch is greater than that on one-sided PWB.
   Be sure to check the influence as well as the heat resistance rating of the solder.

2. Notes on circuit conditions

1. When a power switch is used with a weak current of less than 500 mA, the film on the surface of contact cannot be broken and contact failure may occur.
2. The durability of power switches varies with the type of the switch: those for ac power and those for dc power. When using switches for ac power, check the durability. When using switches for dc power, review and check the load conditions of a relevant set.
3. Use the switches within their rating, including inrush current rating. Check particularly the inrush current using a switch with a set. Since voltage fluctuation occurs depending on geographical region, review the derating for using a switch.
4. If load conditions vary in a set to be used, adaptability with the switch must be considered. Be sure to check the above mentioned notes 1 to 3.

3. Prohibited items and notes on mounting and operating conditions

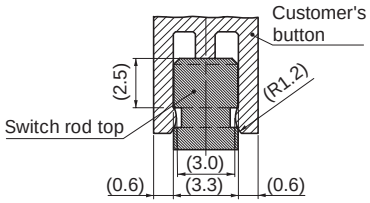
1. In principle, operate the center of the lever.
2. For mounting an operation button:
   1) Design so that the button is mounted to the center of the lever.



   2) Design so that the load in removal and mounting of the button is within the range of the switch’s strength rating of the operational part.

3. Do not pull the switch rod while it is locked. Otherwise, the self-locking function may be broken, resulting in a locking failure or malfunction. Make sure that the switch is released especially when attaching/detaching a button to the rod and assembling/disassembling the target product. (This applies to the self-locking switches) Set the strength for detaching your button (knob) from our switch rod to a maximum of 10 N in order to minimize the possibility of a breakdown of the locking function. When designing your button, refer to the following shape and dimensions.
   Before adopting our switches, check the requirements carefully.

Reference of Customer's button design



4. When mounting a switch to a set, check the switch ON/OFF setting and the position of the operational part (slide type, rotary type, etc.).
5. Design and use so that external stress is not continuously applied to the soldering parts (solder lugs and PWB terminals) with a switch mounted in a set.
6. In actual operating conditions, do not use switches under ambient temperatures above 70 °C.
7. Avoid the following ambient surroundings and other conditions because they may affect performance:
   - Under an atmosphere of corrosive gas such as Cl_2, H_2S, NOx, or SO_2
   - In atmospheres of residual water drops, dew condensation, or adhesive water drops
   - In liquids such as water, salt solution, oil, chemicals, and organic solvents
   - In direct sunlight
   - In dusty locations

4. Prohibited items and notes on storage conditions

Since contact characteristics and soldering quality may deteriorate due to sulfuration and oxidation of contacts and terminals, pay heed to the following items.

1. For storage and transport of the switches, avoid unpacking them, and store them at room temperature and room humidity. Use them as soon as possible, generally within 3 months, or within a maximum of 6 months after delivery.
2. Do not store the switches under conditions of high temperature and/or high humidity, or in a location where corrosive gas may be generated.
3. If some units remain after unpacking, store them after applying adequate moisture-proof and gas-proof treatment.

5. For use in equipment for which safety requested

Although care is taken to ensure switch quality, variation of contact resistance (increase), short circuits, open circuits, and temperature rise are some problems that might be generated.
To design a set which places maximum emphasis on safety, review the affect of any single fault of a switch in advance and perform virtually fail-safe design to ensure maximum safety by:

1. preparing a protective circuit or a protective device to improve system safety, and
2. preparing a redundant circuit to improve system safety so that the single fault of a switch does not cause a dangerous situation.

6. For actual use, be sure to refer to “Product Specifications for Information.”

■ Indications of Safety Standard

UL	U.S.A	
CSA	Canada	
SEMKO	Sweden	
VDE	Germany	
SEV	Switzerland	
BEAB	U.U.K	
DEMKO	Denmark	
NEMKO	Norway	
FIMKO	Finland	

■ Standard Products

Series		Part Numbers	Circuit	Power Rating	Acguired Safety Standard	Shape	Terminal Type		Lock Travel (mm)		Mounting height from PWB to lever (mm)	Mounting Spec.				Page
							Solder Lug	PWB Mount	1.5 mm	2.5 mm		M3 Tap	ϕ3.2 Hole	ϕ3.2 Hole Self Standing Type	W/O Plate Self Standing Type	
Series R1	ESB92S Type	ESB92S27B	SPST	TV-5 5 A 250 V ac 4 A/128 A 250 V ac	UL CSA SEMKO VDE BEAB SEV DEMKO NEMKO FIMKO	No.1	●			●	6.5 mm		●			13
		ESB92S17B	SPST			No.1-a	●		●		6.5 mm		●			
		ESB92S28B	SPST			–	●			●	6.5 mm	●				
		ESB92S18B	SPST			–	●		●		6.5 mm	●				
		ESB92S21B	SPST			No.2		●		●	6.5 mm				●	
		ESB92S11B	SPST			No.2-a		●	●		6.5 mm				●	
		ESB92S81B	SPST			No.3		●		●	12.5 mm				●	
		ESB92S94B	SPST			No.3-a		●	●		12.5 mm				●	
		ESB92S22B	SPST			–		●		●	6.5 mm			●		
Series R2	ESB92D Type	ESB92D27B	DPST	TV-5 5 A 250 V ac 4 A/128 A 250 V ac	UL CSA SEMKO VDE BEAB SEV DEMKO NEMKO FIMKO	No.1	●			●	6.5 mm		●			16
		ESB92D17B	DPST			No.1-a	●		●		6.5 mm		●			
		ESB92D28B	DPST			–	●			●	6.5 mm	●				
		ESB92D18B	DPST			–	●		●		6.5 mm	●				
		ESB92D21B	DPST			No.2		●		●	6.5 mm				●	
		ESB92D11B	DPST			No.2-a		●	●		6.5 mm				●	
		ESB92D22B	DPST			–		●		●	6.5 mm			●		
		ESB92D12B	DPST			–		●	●		6.5 mm			●		

■ Minimum Quantity/Packing Unit

Please place an order by an integer multiple of the Quantity/Carton.

Product Item (Series, Type)	Part No.	Packaging	Quantity/Carton (Export)	Min. Q'ty/ Packing Unit	Notes
Series: R, Type ESB92	ESB92S	Polyethylene Bag (Bulk)	600 pcs. (1800 pcs.)	50 pcs.	
	ESB92D		300 pcs. (900 pcs.)	25 pcs.	

Common Specifications for Push Type Power Switches (Series R)

Type: **ESB92**

■ Mechanical Specifications

Terminal Strength	To withstand 10 N push force applied at the terminal top in any direction for 1 minute without damage or loosening
Lever Strength	To withstand 50 N push force applied along the lever for 1 minute
Lever Wobble	1 mm max. in any direction at the lever top
Contact Pressure	300 mN min.

■ Electrical Specifications and Operating Temperature

Contact Resistance	After several non-loaded operations: 50 mΩ max. (at 1 A 5 Vdc)
Insulation Resistance	Terminal to Terminal, Terminal to Frame: 100 MΩ min. at 500 Vdc
Dielectric Withstanding Voltage	As per applicable Safety Standard
Operating Temperature	–10 °C to +60 °C